

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Application of:

WILSON TAM ET AL.

CASE NO.: CL1253 US DIV

**DIVISIONAL OF**

APPLICATION NO.: 09/399,261

GROUP ART UNIT: 1711

FILED:

EXAMINER: D. TRUONG

**FOR: POLYMERIC PHOSPHITE COMPOSITION AND  
HYDROCYANATION OF UNSATURATED  
ORGANIC COMPOUNDS AND THE  
ISOMERIZATION OF UNSATURATED NITRILES**

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents

Washington, DC 20231

Sir:

Before examination of the above-referenced application, please amend the application as follows:

**IN THE SPECIFICATION:**

Please add the following paragraph before the first paragraph on page 1:

This application is a divisional of application number 09/399,261, which was filed on September 20, 1999.

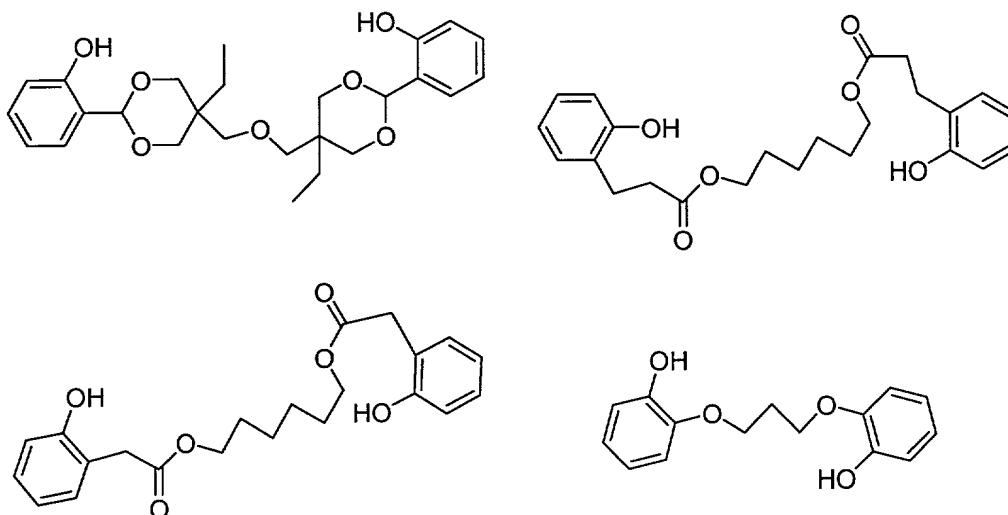
**IN THE CLAIMS:**

**(CLEAN VERSION)**

14. (Once amended) A composition according to Claim 13 wherein  
said polyhydric alcohol is selected from the group consisting of  $(OH)_m$   
 $(R^4)Ar^1-Ar^1(R^4)(OH)_m$  and  $(OH)_m(R^4)Ar^1-A^1-Ar^1(R^4)(OH)_m$ ;  
 $Ar^1$  and  $A^1$  are the same as recited in Claim 13; and  
each  $R^4$  is independently selected from the group consisting of  $C_1$  to  $C_{12}$   
alkyl or cycloalkyl group, acetal, ketal,  $-OR^3$ ,  $-CO_2R^3$ ,  $C_6$  to  $C_{20}$  aryl group,  $-SiR^3$ , -

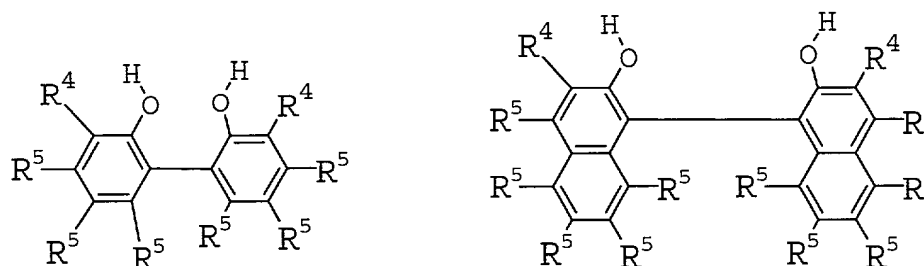
$\text{SO}_3\text{R}^3$ ,  $-\text{S}(\text{O})\text{R}^3$ ,  $-\text{S}(\text{O})_2\text{R}^3$ , perhaloalkyl,  $-\text{C}(\text{O})\text{N}(\text{R}^3)(\text{R}^3)$ ,  $-\text{A}^1\text{CO}_2\text{R}^3$ ,  $-\text{A}^1\text{OR}^3$  and combinations of two or more thereof.

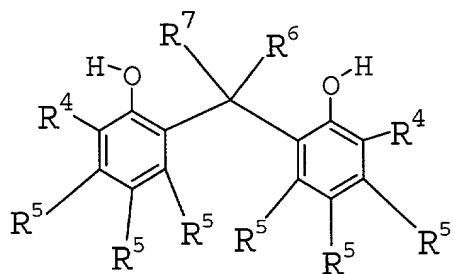
16. (Once amended) A composition according to Claim 15 said polyhydric alcohol is selected from the group consisting of 6,6'-dihydroxy-4,4',7,7,7'-hexamethyl bis-2,2'-spirochroman, 2,2'-diallylbisphenolA, bisphenol A, 4,4'-(1-methylethylidene)bis(2-(1-methylpropyl)phenol), 4,4'-thiophenol, 4,4'-dihydroxydiphenylsulfone, 4,4'-sulfonylbis(2-methylphenol), bis(4-hydroxy-3-methylphenyl)sulfide, 2,2'-dis(4-hydroxy-3-methylphenyl)propane, 4,4'-ethylidenebis(2,5-dimethylphenol), 4,4'-propylidenebis(2,5-dimethylphenol), 4,4'-benzylidenebis(2,5-dimethylphenol), 4,4'-ethylidenebis(2-isopropyl-5-methylphenol),



and combinations of two or more thereof.

17. (Once amended) A composition according to Claim 16 wherein said aromatic diol has the formula selected from the group consisting of





and combinations of two or more thereof;

each  $R^4$  is independently selected from the group consisting of hydrogen,  $C_1$  to  $C_{12}$  alkyl or cycloalkyl group, acetal, ketal,  $-OR^3$ ,  $-CO_2R^3$ ,  $C_6$  to  $C_{20}$  aryl group,  $-SiR^3$ ,  $-NO_2$ ,  $-SO_3R^3$ ,  $-S(O)R^3$ ,  $-S(O)_2R^3$ ,  $-CHO$ ,  $-C(O)R^3$ ,  $-F$ ,  $-Cl$ ,  $-CN$ ,  $-CF_3$ ,  $-C(O)N(R^3)(R^3)$ ,  $-A^1Z$ , and combinations of two or more thereof;

$Z$  is selected from the group consisting of  $-CO_2R^3$ ,  $-CHO$ ,  $-C(O)R^3$ ,  $-C(O)SR^3$ ,  $-SR^3$ ,  $-C(O)NR^1R^1$ ,  $-OC(O)R^3$ ,  $-OC(O)OR^3$ ,  $-N=CR^1R^1$ ,  $-C(R^1)=NR^1$ ,  $-C(R^1)=N-O-R^1$ ,  $-P(O)(OR^3)(OR^3)$ ,  $-S(O)_2R^3$ ,  $-S(O)R^3$ ,  $-C(O)OC(O)R^3$ ,  $-NR^3CO_2R^3$ ,  $-NR^3C(O)NR^1R^1$ ,  $F$ ,  $Cl$ ,  $-NO_2$ ,  $-SO_3R^3$ ,  $-CN$ , and combinations of two or more thereof;

each  $R^3$  is independently selected from the group consisting of  $C_1$  to  $C_{12}$  alkyl or cycloalkyl group,  $C_6$  to  $C_{20}$  aryl group, and combinations of two or more thereof;

each  $R^5$  is independently selected from the group consisting of  $H$ ,  $F$ ,  $Cl$ ,  $C_1$  to  $C_{12}$  alkyl,  $C_1$  to  $C_{12}$  cycloalkyl,  $C_6$  to  $C_{20}$  aryl,  $-OR^3$ ,  $-CO_2R^3$ ,  $-C(O)R^3$ ,  $-CHO$ ,  $-CN$ ,  $-CF_3$ , and combinations of two or more thereof;

each  $R^6$  independently is selected from the group consisting of  $H$ ,  $C_1$  to  $C_{12}$  alkyl,  $C_1$  to  $C_{12}$  cycloalkyl,  $C_6$  to  $C_{20}$  aryl, and combinations of two or more thereof; and

each  $R^7$  independently is selected from the group consisting of  $H$ ,  $C_1$  to  $C_{12}$  alkyl,  $C_1$  to  $C_{12}$  cycloalkyl,  $C_6$  to  $C_{20}$  aryl, and combinations of two or more thereof.

18. (Once amended) A composition according to Claim 17 further comprising at least one Group VIII metal selected from the group consisting of nickel, palladium, cobalt, and combinations of two or more thereof.

38. (Once amended) A process according to Claim 36 wherein

said polyhydric alcohol is selected from the group consisting of  $(OH)_m$   $(R^4)Ar^1$ -  $Ar^1(R^4)(OH)_m$  and  $(OH)_m$   $(R^4)Ar^1-A^1-Ar^1$   $(R^4)(OH)_m$ ;

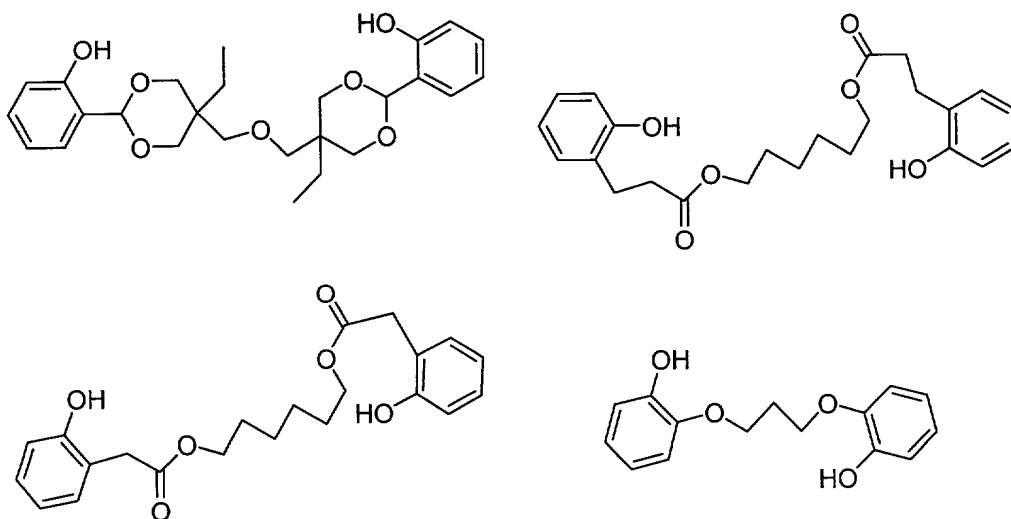
$Ar^1$  and  $A^1$  are the same as recited in Claim 14; and

each  $R^4$  is independently selected from the group consisting of  $C_1$  to  $C_{12}$  alkyl or cycloalkyl group, acetal, ketal,  $-OR^3$ ,  $-CO_2R^3$ ,  $C_1$  to  $C_{20}$  aryl group,  $-SiR^3$ , -

$\text{SO}_3\text{R}^3$ ,  $-\text{S}(\text{O})\text{R}^3$ ,  $-\text{S}(\text{O})_2\text{R}^3$ , perhaloalkyl,  $-\text{C}(\text{O})\text{N}(\text{R}^3)(\text{R}^3)$ ,  $-\text{A}^1\text{CO}_2\text{R}^3$ ,  $-\text{A}^1\text{OR}^3$  and combinations of two or more thereof.

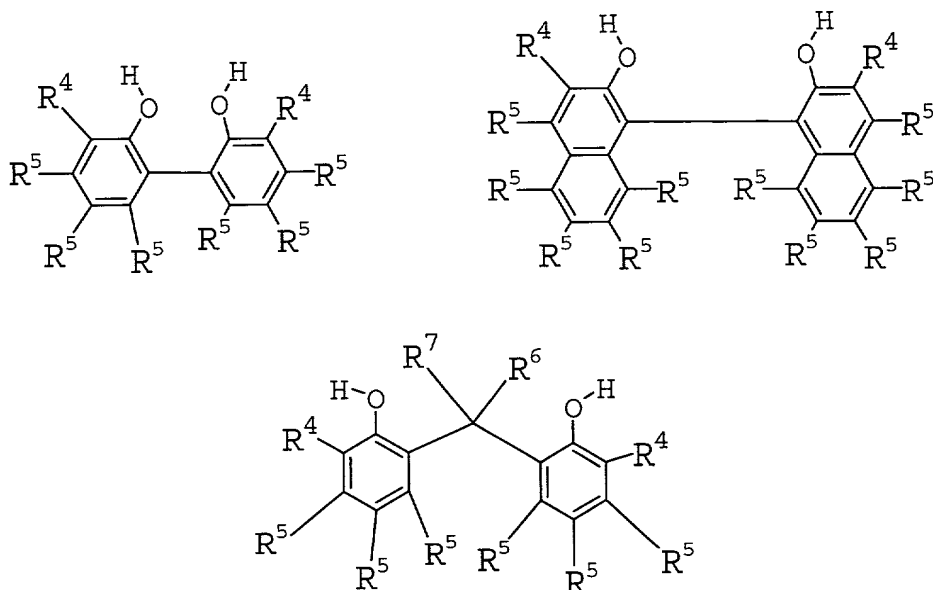
39. (Once amended) A process according to Claim 38 wherein the location of the OH groups of said polyhydric alcohol are placed such that, when said polyhydric alcohol is contacted with  $\text{PCl}_3$ , monodentate phosphites are not predominately produced.

40. (Once amended) A process according to Claim 39 wherein said polyhydric alcohol is selected from the group consisting of 6,6'-dihydroxy-4,4,4',7,7,7'-hexamethyl bis-2,2'-spirochroman, 2,2'-diallylbisphenolA, bisphenol A, 4,4'-(1-methylethylidene)bis(2-(1-methylpropyl)phenol), 4,4'-thiophenol, 4,4'-dihydroxydiphenylsulfone, 4,4'-sulfonylbis(2-methylphenol), bis(4-hydroxy-3-methylphenyl)sulfide, 2,2'-dis(4-hydroxy-3-methylphenyl)propane, 4,4'-ethylidenebis(2,5-dimethylphenol), 4,4'-propylidenebis(2,5-dimethylphenol), 4,4'-benzylidenebis(2,5-dimethylphenol), 4,4'-ethylidenebis(2-isopropyl-5-methylphenol),



and combinations of two or more thereof.

41. (Once amended) A process according to Claim 34 or 35 wherein said aromatic diol has the formula selected from the group consisting of



and combinations of two or more thereof;

each R<sup>4</sup> is independently selected from the group consisting of hydrogen, C<sub>1</sub> to C<sub>12</sub> alkyl group, C<sub>1</sub> to C<sub>12</sub> cycloalkyl group, acetal, ketal, -OR<sup>3</sup>, -CO<sub>2</sub>R<sup>3</sup>, C<sub>1</sub> to C<sub>20</sub> aryl group, -SiR<sup>3</sup>, -NO<sub>2</sub>, -SO<sub>3</sub>R<sup>3</sup>, -S(O)R<sup>3</sup>, -S(O)<sub>2</sub>R<sup>3</sup>, -CHO, -C(O)R<sup>3</sup>, -F, -Cl, -CN, -CF<sub>3</sub>, -C(O)N(R<sup>3</sup>)(R<sup>3</sup>), -A<sup>1</sup>Z, and combinations of two or more thereof;

Z is selected from the group consisting of -CO<sub>2</sub>R<sup>3</sup>, -CHO, -C(O)R<sup>3</sup>, -C(O)SR<sup>3</sup>, -SR<sup>3</sup>, -C(O)NR<sup>1</sup>R<sup>1</sup>, -OC(O)R<sup>3</sup>, -OC(O)OR<sup>3</sup>, -N=CR<sup>1</sup>R<sup>1</sup>, -C(R<sup>1</sup>)=NR<sup>1</sup>,

-C(R<sup>1</sup>)=N-O-R<sup>1</sup>, -P(O)(OR<sup>3</sup>)(OR<sup>3</sup>), -S(O)<sub>2</sub>R<sup>3</sup>, -S(O)R<sup>3</sup>, -C(O)OC(O)R<sup>3</sup>, -NR<sup>3</sup>CO<sub>2</sub>R<sup>3</sup>, -NR<sup>3</sup>C(O)NR<sup>1</sup>R<sup>1</sup>, F, Cl, -NO<sub>2</sub>, -SO<sub>3</sub>R<sup>3</sup>, -CN, and combinations of two or more thereof;

each R<sup>3</sup> is independently selected from the group consisting of C<sub>1</sub> to C<sub>12</sub> alkyl or cycloalkyl group, C<sub>1</sub> to C<sub>20</sub> aryl group, and combinations of two or more thereof;

each R<sup>5</sup> is independently selected from the group consisting of H, F, Cl, C<sub>1</sub> to C<sub>12</sub> alkyl or cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, -OR<sup>3</sup>, -CO<sub>2</sub>R<sup>3</sup>, -C(O)R<sup>3</sup>, -CHO, -CN, -CF<sub>3</sub>, and combinations of two or more thereof;

each R<sup>6</sup> independently is selected from the group consisting of H, C<sub>1</sub> to C<sub>12</sub> alkyl or cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, and combinations of two or more thereof; and

each R<sup>7</sup> independently is selected from the group consisting of H, C<sub>1</sub> to C<sub>12</sub> alkyl or cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, and combinations of two or more thereof.

45. (Once amended) A process comprising (a) contacting a diolefinic compound, in the presence of a catalyst composition, with a fluid comprising hydrogen cyanide to produce a 2-alkyl-3-monoalkenenitrile; and (b) contacting said 2-alkyl-3-monoalkenenitrile with said catalyst composition wherein said catalyst composition is the composition recited in claims 18-21.

48. (Once amended) A process comprising contacting a 2-alkyl-3-monoalkenenitrile with a catalyst composition wherein said catalyst composition is the composition recited in Claims 18-21.

50. (New) A polymeric composition comprising repeat units derived from (1) a carbonyl compound, (2) a monomer, and (3) phosphorochloridite wherein said carbonyl compound has the formula selected from the group consisting of  $(R^1O_2C)_m(OH)-Ar^1-(OH)(CO_2R^1)_m$ ,  $(R^1O_2C)_m(OH)-Ar^2-A^2-Ar^2-(OH)(CO_2R^1)_m$ ,  $(R^1O_2C)_m(OH)-Ar^2-Ar^2-(OH)(CO_2R^1)_m$  and combinations of two or more thereof;

said monomer is selected from the group consisting of polyhydric alcohols, amines, and combinations thereof,

said phosphorochloridite has the formula selected from the group consisting of  $ClP(O-Ar^2-R^2)_2$ ; the  $Ar^2$  groups in  $ClP(O-Ar^2-R^2)_2$  are unlinked to each other, directly linked to each other, or linked to each other through group  $A^2$ ;

each  $Ar^1$  is selected from the group consisting of  $C_6$  to  $C_{40}$  phenylene group,  $C_{12}$  to  $C_{40}$  biphenylene group,  $C_{10}$  to  $C_{40}$  naphthylene group,  $C_{20}$  to  $C_{40}$  binaphthylene group, and combinations of two or more thereof;

each  $Ar^2$  is independently selected from the group consisting of  $C_6$  to  $C_{40}$  phenylene group,  $C_{10}$  to  $C_{40}$  naphthylene group, and combinations thereof;

$A^2$  is selected from the group consisting of  $-C(R^1)(R^1)$ ,  $-O-$ ,  $-N(R^1)-$ ,  $-S-$ ,  $-S(O)_2-$ ,  $-S(O)-$ , and combinations of two or more thereof;

each  $R^1$  is independently selected from the group consisting of hydrogen,  $C_1$  to  $C_{12}$  alkyl group or cycloalkyl group,  $C_6$  to  $C_{20}$  aryl group, and combinations of two or more thereof;

each  $R^2$  is independently selected from the group consisting of hydrogen,  $C_1$  to  $C_{12}$  alkyl or cycloalkyl group, acetal, ketal,  $-OR^3$ ,  $-CO_2R^3$ ,  $C_6$  to  $C_{20}$  aryl group, F, Cl,  $-NO_2$ ,  $-SO_3R^3$ ,  $-CN$ , perhaloalkyl,  $-S(O)R^3$ ,  $-S(O)_2R^3$ ,  $-CHO$ ,  $-C(O)R^3$ , cyclic ether,  $-A^1Z$ , and combinations of two or more thereof;

$A^1$  is a  $C_1$  to  $C_{12}$  alkylene group;

Z is selected from the group consisting of  $-\text{CO}_2\text{R}^3$ ,  $-\text{CHO}$ ,  $-\text{C}(\text{O})\text{R}^3$ ,  $-\text{C}(\text{O})\text{SR}^3$ ,  $-\text{SR}^3$ ,  $-\text{C}(\text{O})\text{NR}^1\text{R}^1$ ,  $-\text{OC}(\text{O})\text{R}^3$ ,  $-\text{OC}(\text{O})\text{OR}^3$ ,  $-\text{N}=\text{C}(\text{R}^1)\text{R}^1$ ,  $-\text{C}(\text{R}^1)=\text{NR}^1$ ,  $-\text{C}(\text{R}^1)=\text{N}-\text{O}-\text{R}^1$ ,  $-\text{P}(\text{O})(\text{OR}^3)(\text{OR}^3)$ ,  $-\text{S}(\text{O})_2\text{R}^3$ ,  $-\text{S}(\text{O})\text{R}^3$ ,  $-\text{C}(\text{O})\text{OC}(\text{O})\text{R}^3$ ,  $-\text{NR}^3\text{CO}_2\text{R}^3$ ,  $-\text{NR}^3\text{C}(\text{O})\text{N}(\text{R}^1)\text{R}^1$ , F, Cl,  $-\text{NO}_2$ ,  $-\text{SO}_3\text{R}^3$ ,  $-\text{CN}$ , and combinations of two or more thereof;

each  $\text{R}^3$  is independently selected from the group consisting of  $\text{C}_1$  to  $\text{C}_{12}$  alkyl or cycloalkyl group,  $\text{C}_6$  to  $\text{C}_{20}$  aryl group, and combinations thereof; and

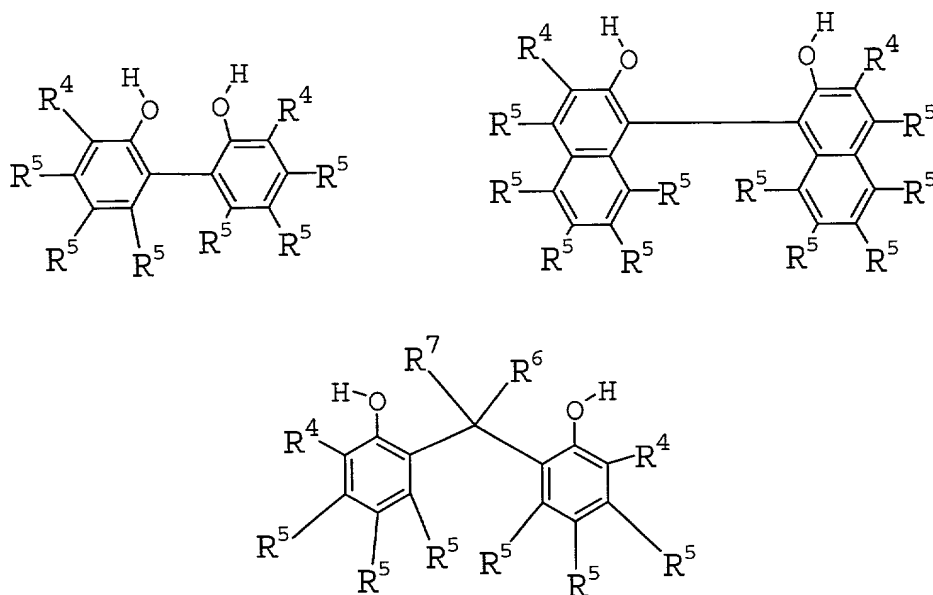
each m is independently a number in the range of from 1 to 2 further comprising at least one Group VIII metal selected from the group consisting of nickel, palladium, cobalt, and combinations of two or more thereof.

51. (New) The composition of claim 50 further comprising at least one Lewis acid which is an inorganic compound or organometallic compound in which the element of said inorganic compound or organometallic compound is selected from the group consisting of scandium, titanium, vanadium, chromium, manganese, iron, cobalt, copper, zinc, boron, aluminum, yttrium, zirconium, niobium, molybdenum, cadmium, rhenium, tin, and combinations of two or more thereof.

52. (New) The composition of claim 51 wherein said Lewis acid is selected from the group consisting of  $\text{ZnBr}_2$ ,  $\text{ZnI}_2$ ,  $\text{ZnCl}_2$ ,  $\text{ZnSO}_4$ ,  $\text{CuCl}_2$ ,  $\text{CuCl}$ ,  $\text{Cu}(\text{O}_3\text{SCF}_3)_2$ ,  $\text{CoCl}_2$ ,  $\text{CoI}_2$ ,  $\text{FeI}_2$ ,  $\text{FeCl}_3$ ,  $\text{FeCl}_2(\text{tetrahydrofuran})_2$ ,  $\text{FeCl}_2$ ,  $\text{TiCl}_4(\text{tetrahydrofuran})_2$ ,  $\text{TiCl}_4$ ,  $\text{TiCl}_3$ ,  $\text{ClTi}(\text{OiPr})_3$ ,  $\text{MnCl}_2$ ,  $\text{ScCl}_3$ ,  $\text{AlCl}_3$ ,  $(\text{C}_8\text{H}_{17})\text{AlCl}_2$ ,  $(\text{C}_8\text{H}_{17})_2\text{AlCl}$ ,  $(\text{iso-C}_4\text{H}_9)_2\text{AlCl}$ ,  $(\text{phenyl})_2\text{AlCl}$ ,  $\text{phenylAlCl}_2$ ,  $\text{ReCl}_5$ ,  $\text{ZrCl}_4$ ,  $\text{NbCl}_5$ ,  $\text{VCl}_3$ ,  $\text{CrCl}_2$ ,  $\text{MoCl}_5$ ,  $\text{YCl}_3$ ,  $\text{CdCl}_2$ ,  $\text{LaCl}_3$ ,  $\text{Er}(\text{O}_3\text{SCF}_3)_3$ ,  $\text{Yb}(\text{O}_2\text{CCF}_3)_3$ ,  $\text{SmCl}_3$ ,  $\text{TaCl}_5$ ,  $\text{CdCl}_2$ ,  $\text{B}(\text{C}_6\text{H}_5)_3$ , and  $(\text{C}_6\text{H}_5)_3\text{SnX}$ , and combinations of two or more thereof; and X is selected from the group consisting of  $\text{CF}_3\text{SO}_3$ ,  $\text{CH}_3\text{C}_6\text{H}_5\text{SO}_3$ ,  $(\text{C}_6\text{H}_5)_3\text{BCN}$ , and combinations of two or more thereof.

53. (New) The composition of claim 52 wherein said Lewis acid is selected from the group consisting of zinc chloride, cadmium chloride, iron chloride, triphenylboron,  $(\text{C}_6\text{H}_5)_3\text{SnX}$ , and combinations of two or more thereof; and X is selected from the group consisting of  $\text{CF}_3\text{SO}_3$ ,  $\text{CH}_3\text{C}_6\text{H}_5\text{SO}_3$ ,  $(\text{C}_6\text{H}_5)_3\text{BCN}$ , and combinations of two or more thereof.

54. (New) A composition according to claim 15 wherein said aromatic diol has the formula selected from the group consisting of



and combinations of two or more thereof;

each R<sup>4</sup> is independently selected from the group consisting of hydrogen, C<sub>1</sub> to C<sub>12</sub> alkyl or cycloalkyl group, acetal, ketal, -OR<sup>3</sup>, -CO<sub>2</sub>R<sup>3</sup>, C<sub>6</sub> to C<sub>20</sub> aryl group, -SiR<sup>3</sup>, -NO<sub>2</sub>, -SO<sub>3</sub>R<sup>3</sup>, -S(O)R<sup>3</sup>, -S(O)<sub>2</sub>R<sup>3</sup>, -CHO, -C(O)R<sup>3</sup>, -F, -Cl, -CN,

-CF<sub>3</sub>, -C(O)N(R<sup>3</sup>)(R<sup>3</sup>), -A<sup>1</sup>Z, and combinations of two or more thereof;

Z is selected from the group consisting of -CO<sub>2</sub>R<sup>3</sup>, -CHO, -C(O)R<sup>3</sup>, -C(O)SR<sup>3</sup>, -SR<sup>3</sup>, -C(O)NR<sup>1</sup>R<sup>1</sup>, -OC(O)R<sup>3</sup>, -OC(O)OR<sup>3</sup>, -N=CR<sup>1</sup>R<sup>1</sup>, -C(R<sup>1</sup>)=NR<sup>1</sup>, -C(R<sup>1</sup>)=N-O-R<sup>1</sup>, -P(O)(OR<sup>3</sup>)(OR<sup>3</sup>), -S(O)<sub>2</sub>R<sup>3</sup>, -S(O)R<sup>3</sup>, -C(O)OC(O)R<sup>3</sup>, -NR<sup>3</sup>CO<sub>2</sub>R<sup>3</sup>, -NR<sup>3</sup>C(O)NR<sup>1</sup>R<sup>1</sup>, F, Cl, -NO<sub>2</sub>, -SO<sub>3</sub>R<sup>3</sup>, -CN, and combinations of two or more thereof;

each R<sup>3</sup> is independently selected from the group consisting of C<sub>1</sub> to C<sub>12</sub> alkyl or cycloalkyl group, C<sub>6</sub> to C<sub>20</sub> aryl group, and combinations of two or more thereof;

each R<sup>5</sup> is independently selected from the group consisting of H, F, Cl, C<sub>1</sub> to C<sub>12</sub> alkyl, C<sub>1</sub> to C<sub>12</sub> cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, -OR<sup>3</sup>, -CO<sub>2</sub>R<sup>3</sup>, -C(O)R<sup>3</sup>, -CHO, -CN, -CF<sub>3</sub>, and combinations of two or more thereof;

each R<sup>6</sup> independently is selected from the group consisting of H, C<sub>1</sub> to C<sub>12</sub> alkyl, C<sub>1</sub> to C<sub>12</sub> cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, and combinations of two or more thereof;  
and

each R<sup>7</sup> independently is selected from the group consisting of H, C<sub>1</sub> to C<sub>12</sub> alkyl, C<sub>1</sub> to C<sub>12</sub> cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, and combinations of two or more thereof.

55. (New) A composition according to any of Claims 15 further comprising at least one Group VIII metal selected from the group consisting of nickel, palladium, cobalt, and combinations of two or more thereof.

56. (New) A composition according to any of Claims 16 further comprising at least one Group VIII metal selected from the group consisting of nickel, palladium, cobalt, and combinations of two or more thereof.

57. (New) A composition according to claim 55 further comprising at least one Lewis acid which is an inorganic compound or organometallic compound in which the element of said inorganic compound or organometallic compound is selected from the group consisting of scandium, titanium, vanadium, chromium, manganese, iron, cobalt, copper, zinc, boron, aluminum, yttrium, zirconium, niobium, molybdenum, cadmium, rhenium, tin, and combinations of two or more thereof.

58. (New) A composition according to Claim 57 wherein said Lewis acid is selected from the group consisting of  $\text{ZnBr}_2$ ,  $\text{ZnI}_2$ ,  $\text{ZnCl}_2$ ,  $\text{ZnSO}_4$ ,  $\text{CuCl}_2$ ,  $\text{CuCl}$ ,  $\text{Cu}(\text{O}_3\text{SCF}_3)_2$ ,  $\text{CoCl}_2$ ,  $\text{CoI}_2$ ,  $\text{FeI}_2$ ,  $\text{FeCl}_3$ ,  $\text{FeCl}_2(\text{tetrahydrofuran})_2$ ,  $\text{FeCl}_2$ ,  $\text{TiCl}_4(\text{tetrahydrofuran})_2$ ,  $\text{TiCl}_4$ ,  $\text{TiCl}_3$ ,  $\text{ClTi}(\text{OiPr})_3$ ,  $\text{MnCl}_2$ ,  $\text{ScCl}_3$ ,  $\text{AlCl}_3$ ,  $(\text{C}_8\text{H}_{17})\text{AlCl}_2$ ,  $(\text{C}_8\text{H}_{17})_2\text{AlCl}$ ,  $(\text{iso-C}_4\text{H}_9)_2\text{AlCl}$ ,  $(\text{phenyl})_2\text{AlCl}$ ,  $\text{phenylAlCl}_2$ ,  $\text{ReCl}_5$ ,  $\text{ZrCl}_4$ ,  $\text{NbCl}_5$ ,  $\text{VCl}_3$ ,  $\text{CrCl}_2$ ,  $\text{MoCl}_5$ ,  $\text{YCl}_3$ ,  $\text{CdCl}_2$ ,  $\text{LaCl}_3$ ,  $\text{Er}(\text{O}_3\text{SCF}_3)_3$ ,  $\text{Yb}(\text{O}_2\text{CCF}_3)_3$ ,  $\text{SmCl}_3$ ,  $\text{TaCl}_5$ ,  $\text{CdCl}_2$ ,  $\text{B}(\text{C}_6\text{H}_5)_3$ , and  $(\text{C}_6\text{H}_5)_3\text{SnX}$ , and combinations of two or more thereof; and X is selected from the group consisting of  $\text{CF}_3\text{SO}_3$ ,  $\text{CH}_3\text{C}_6\text{H}_5\text{SO}_3$ ,  $(\text{C}_6\text{H}_5)_3\text{BCN}$ , and combinations of two or more thereof.

59. (New) A composition according to Claim 58 wherein said Lewis acid is selected from the group consisting of zinc chloride, cadmium chloride, iron chloride, triphenylboron,  $(\text{C}_6\text{H}_5)_3\text{SnX}$ , and combinations of two or more thereof; and X is selected from the group consisting of  $\text{CF}_3\text{SO}_3$ ,  $\text{CH}_3\text{C}_6\text{H}_5\text{SO}_3$ ,  $(\text{C}_6\text{H}_5)_3\text{BCN}$ , and combinations of two or more thereof.

60. (New) A composition according to claim 56 further comprising at least one Lewis acid which is an inorganic compound or organometallic compound in which the element of said inorganic compound or organometallic compound is selected from the group consisting of scandium, titanium, vanadium, chromium, manganese, iron, cobalt, copper, zinc, boron, aluminum, yttrium, zirconium, niobium, molybdenum, cadmium, rhenium, tin, and combinations of two or more thereof.

61. (New) A composition according to Claim 60 wherein said Lewis acid is selected from the group consisting of  $\text{ZnBr}_2$ ,  $\text{ZnI}_2$ ,  $\text{ZnCl}_2$ ,  $\text{ZnSO}_4$ ,  $\text{CuCl}_2$ ,  $\text{CuCl}$ ,

$\text{Cu}(\text{O}_3\text{SCF}_3)_2$ ,  $\text{CoCl}_2$ ,  $\text{CoI}_2$ ,  $\text{FeI}_2$ ,  $\text{FeCl}_3$ ,  $\text{FeCl}_2(\text{tetrahydrofuran})_2$ ,  $\text{FeCl}_2$ ,  $\text{TiCl}_4(\text{tetrahydrofuran})_2$ ,  $\text{TiCl}_4$ ,  $\text{TiCl}_3$ ,  $\text{ClTi}(\text{OiPr})_3$ ,  $\text{MnCl}_2$ ,  $\text{ScCl}_3$ ,  $\text{AlCl}_3$ ,  $(\text{C}_8\text{H}_{17})\text{AlCl}_2$ ,  $(\text{C}_8\text{H}_{17})_2\text{AlCl}$ ,  $(\text{iso-C}_4\text{H}_9)_2\text{AlCl}$ ,  $(\text{phenyl})_2\text{AlCl}$ ,  $\text{phenylAlCl}_2$ ,  $\text{ReCl}_5$ ,  $\text{ZrCl}_4$ ,  $\text{NbCl}_5$ ,  $\text{VCl}_3$ ,  $\text{CrCl}_2$ ,  $\text{MoCl}_5$ ,  $\text{YCl}_3$ ,  $\text{CdCl}_2$ ,  $\text{LaCl}_3$ ,  $\text{Er}(\text{O}_3\text{SCF}_3)_3$ ,  $\text{Yb}(\text{O}_2\text{CCF}_3)_3$ ,  $\text{SmCl}_3$ ,  $\text{TaCl}_5$ ,  $\text{CdCl}_2$ ,  $\text{B}(\text{C}_6\text{H}_5)_3$ , and  $(\text{C}_6\text{H}_5)_3\text{SnX}$ , and combinations of two or more thereof; and X is selected from the group consisting of  $\text{CF}_3\text{SO}_3$ ,  $\text{CH}_3\text{C}_6\text{H}_5\text{SO}_3$ ,  $(\text{C}_6\text{H}_5)_3\text{BCN}$ , and combinations of two or more thereof.

62. (New) A composition according to Claim 61 wherein said Lewis acid is selected from the group consisting of zinc chloride, cadmium chloride, iron chloride, triphenylboron,  $(\text{C}_6\text{H}_5)_3\text{SnX}$ , and combinations of two or more thereof; and X is selected from the group consisting of  $\text{CF}_3\text{SO}_3$ ,  $\text{CH}_3\text{C}_6\text{H}_5\text{SO}_3$ ,  $(\text{C}_6\text{H}_5)_3\text{BCN}$ , and combinations of two or more thereof.

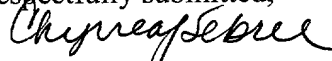
#### REMARKS

By this preliminary amendment, the specification acknowledges that the present application is a divisional of a previously filed application, in which claims 1-10 and 22-33 were allowed.

Applicants have amended certain claims, and have added new claims 50 to 62. Applicant has amended claims to place multiple dependent claims in proper form. Support for the amended and new claims appears in the specification. No new matter is added by this amendment.

Pending are claims 11-21 and 34-49 and upon entry of this amendment, claims 50-62. It is respectfully requested that the preliminary amendment filed herewith be entered before examination of the pending claims.

Respectfully submitted,



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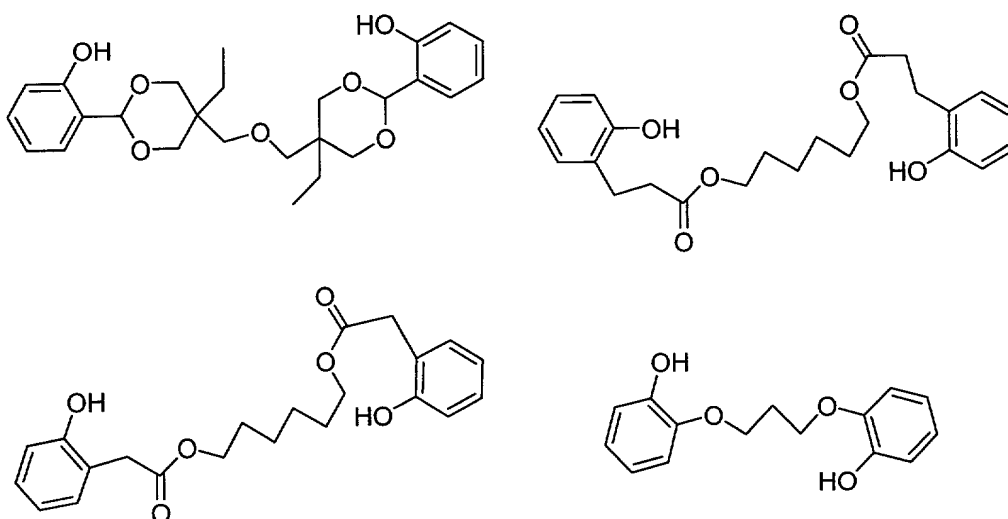
**MARKED-UP VERSION**

14. (Once amended) A composition according to Claim 13 wherein said polyhydric alcohol is selected from the group consisting of  $(\text{OH})_m(\text{R}^4)\text{Ar}^1\text{-Ar}^1(\text{R}^4)(\text{OH})_m$  and  $(\text{OH})_m(\text{R}^4)\text{Ar}^1\text{-A}^1\text{-Ar}^1(\text{R}^4)(\text{OH})_m$   $(\text{OH})_m\text{Ar}^1\text{-R}^4\text{-R}^4\text{-Ar}^1(\text{OH})_m$  and  $(\text{OH})_m\text{Ar}^1\text{-R}^4\text{-A}^1\text{-R}^4\text{-Ar}^1(\text{OH})_m$ ;

$\text{Ar}^1$  and  $\text{A}^1$  are the same as recited in Claim 13; and

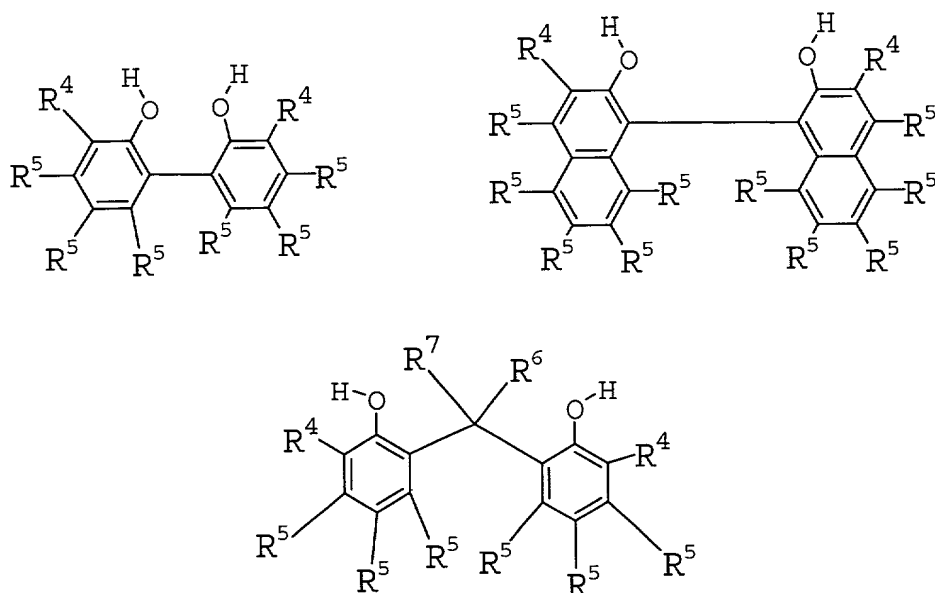
each  $\text{R}^4$  is independently selected from the group consisting of  $\text{C}_1$  to  $\text{C}_{12}$  alkyl or cycloalkyl group, acetal, ketal,  $-\text{OR}^3$ ,  $-\text{CO}_2\text{R}^3$ ,  $\text{C}_6$  to  $\text{C}_{20}$  aryl group,  $-\text{SiR}^3$ ,  $-\text{SO}_3\text{R}^3$ ,  $-\text{S}(\text{O})\text{R}^3$ ,  $-\text{S}(\text{O})_2\text{R}^3$ , perhaloalkyl,  $-\text{C}(\text{O})\text{N}(\text{R}^3)(\text{R}^3)$ ,  $-\text{A}^1\text{CO}_2\text{R}^3$ ,  $-\text{A}^1\text{OR}^3$  and combinations of two or more thereof.

16. (Once amended) A composition according to Claim ~~13, 14, or~~ 15 said polyhydric alcohol is selected from the group consisting of 6,6'-dihydroxy-4,4',7,7'-hexamethyl bis-2,2'-spirochroman, 2,2'-diallylbisphenolA, bisphenol A, 4,4'-(1-methylethylidene)bis(2-(1-methylpropyl)phenol), 4,4'-thiophenol, 4,4'-dihydroxydiphenylsulfone, 4,4'-sulfonylbis(2-methylphenol), bis(4-hydroxy-3-methylphenyl)sulfide, 2,2'-dis(4-hydroxy-3-methylphenyl)propane, 4,4'-ethylidenebis(2,5-dimethylphenol), 4,4'-propylidenebis(2,5-dimethylphenol), 4,4'-benzylidenebis(2,5-dimethylphenol), 4,4'-ethylidenebis(2-isopropyl-5-methylphenol),



and combinations of two or more thereof.

17. (Once amended) A composition according to ~~any of Claims 11 to~~ 16 wherein said aromatic diol has the formula selected from the group consisting of



and combinations of two or more thereof;

each R<sup>4</sup> is independently selected from the group consisting of hydrogen, C<sub>1</sub> to C<sub>12</sub> alkyl or cycloalkyl group, acetal, ketal, -OR<sup>3</sup>, -CO<sub>2</sub>R<sup>3</sup>, C<sub>6</sub> to C<sub>20</sub> aryl group, -SiR<sup>3</sup>, -NO<sub>2</sub>, -SO<sub>3</sub>R<sup>3</sup>, -S(O)R<sup>3</sup>, -S(O)<sub>2</sub>R<sup>3</sup>, -CHO, -C(O)R<sup>3</sup>, -F, -Cl, -CN,

-CF<sub>3</sub>, -C(O)N(R<sup>3</sup>)(R<sup>3</sup>), -A<sup>1</sup>Z, and combinations of two or more thereof;

Z is selected from the group consisting of -CO<sub>2</sub>R<sup>3</sup>, -CHO, -C(O)R<sup>3</sup>, -C(O)SR<sup>3</sup>, -SR<sup>3</sup>, -C(O)NR<sup>1</sup>R<sup>1</sup>, -OC(O)R<sup>3</sup>, -OC(O)OR<sup>3</sup>, -N=CR<sup>1</sup>R<sup>1</sup>, -C(R<sup>1</sup>)=NR<sup>1</sup>, -C(R<sup>1</sup>)=N-O-R<sup>1</sup>, -P(O)(OR<sup>3</sup>)(OR<sup>3</sup>), -S(O)<sub>2</sub>R<sup>3</sup>, -S(O)R<sup>3</sup>, -C(O)OC(O)R<sup>3</sup>, -NR<sup>3</sup>CO<sub>2</sub>R<sup>3</sup>, -NR<sup>3</sup>C(O)NR<sup>1</sup>R<sup>1</sup>, F, Cl, -NO<sub>2</sub>, -SO<sub>3</sub>R<sup>3</sup>, -CN, and combinations of two or more thereof;

each R<sup>3</sup> is independently selected from the group consisting of C<sub>1</sub> to C<sub>12</sub> alkyl or cycloalkyl group, C<sub>6</sub> to C<sub>20</sub> aryl group, and combinations of two or more thereof;

each R<sup>5</sup> is independently selected from the group consisting of H, F, Cl, C<sub>1</sub> to C<sub>12</sub> alkyl, C<sub>1</sub> to C<sub>12</sub> cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, -OR<sup>3</sup>, -CO<sub>2</sub>R<sup>3</sup>, -C(O)R<sup>3</sup>, -CHO, -CN, -CF<sub>3</sub>, and combinations of two or more thereof;

each R<sup>6</sup> independently is selected from the group consisting of H, C<sub>1</sub> to C<sub>12</sub> alkyl, C<sub>1</sub> to C<sub>12</sub> cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, and combinations of two or more thereof;  
and

each R<sup>7</sup> independently is selected from the group consisting of H, C<sub>1</sub> to C<sub>12</sub> alkyl, C<sub>1</sub> to C<sub>12</sub> cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, and combinations of two or more thereof.

18. (Once amended) A composition according to ~~any of Claims 1 to 17~~ further comprising at least one Group VIII metal selected from the group consisting of nickel, palladium, cobalt, and combinations of two or ~~more~~ more thereof.

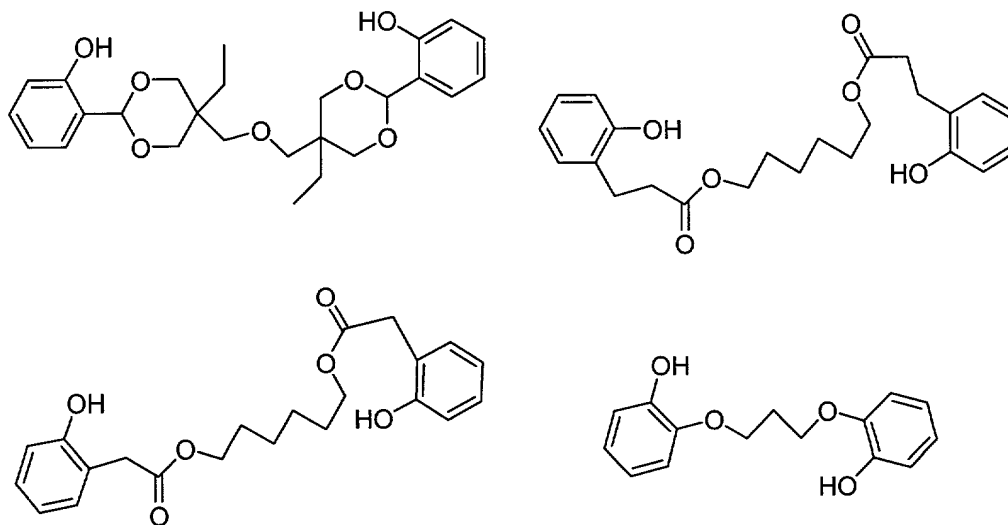
38. (Once amended) A process according to Claim 36 wherein  
said polyhydric alcohol is selected from the group consisting of  $(OH)_m$   
 $(R^4)Ar^1-Ar^1(R^4)(OH)_m$  and  $(OH)_m(R^4)Ar^1-A^1-Ar^1(R^4)(OH)_m-(OH)_mAr^1-R^4-R^4-$   
 $Ar^1(OH)_m$  and  $(OH)_mAr^1-R^4-A^1-R^4-Ar^1(OH)_m$ ;

$Ar^1$  and  $A^1$  are the same as recited in Claim 14; and

each  $R^4$  is independently selected from the group consisting of  $C_1$  to  $C_{12}$  alkyl or cycloalkyl group, acetal, ketal,  $-OR^3$ ,  $-CO_2R^3$ ,  $C_1$  to  $C_{20}$  aryl group,  $-SiR^3$ ,  $-SO_3R^3$ ,  $-S(O)R^3$ ,  $-S(O)_2R^3$ , perhaloalkyl,  $-C(O)N(R^3)(R^3)$ ,  $-A^1CO_2R^3$ ,  $-A^1OR^3$  and combinations of two or more thereof.

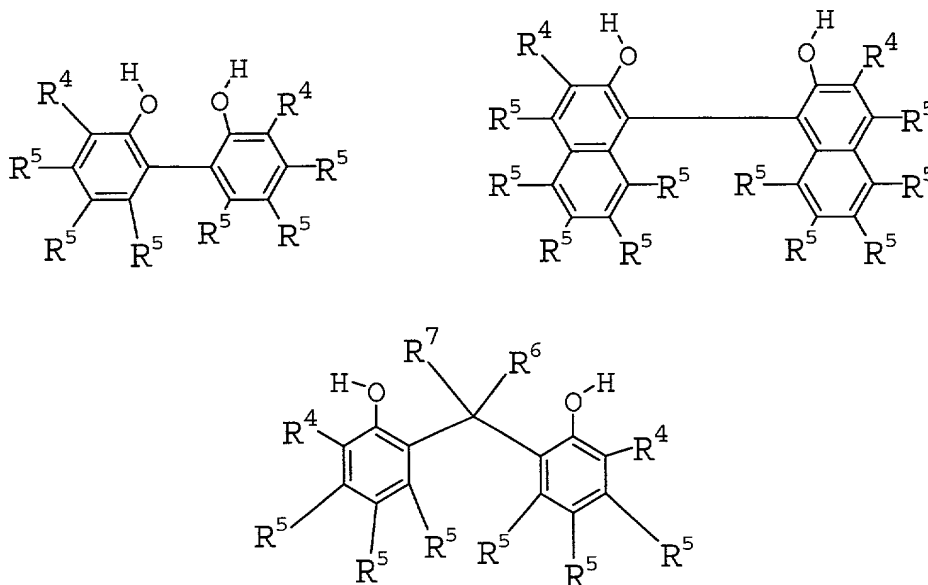
39. (Once amended) A process according to Claim 37 ~~or~~ 38 wherein the location of the OH groups of said polyhydric alcohol are placed such that, when said polyhydric alcohol is contacted with  $PCl_3$ , monodentate phosphites are not predominately produced.

40. (Once amended) A process according to Claim 37, ~~38, or~~ 39 wherein said polyhydric alcohol is selected from the group consisting of 6,6'-dihydroxy-4,4',7,7,7'-hexamethyl bis-2,2'-spirochroman, 2,2'-diallylbisphenolA, bisphenol A, 4,4'-(1-methylethylidene)bis(2-(1-methylpropyl)phenol), 4,4'-thiophenol, 4,4'-dihydroxydiphenylsulfone, 4,4'-sulfonylbis(2-methylphenol), bis(4-hydroxy-3-methylphenyl)sulfide, 2,2'-dis(4-hydroxy-3-methylphenyl)propane, 4,4'-ethylidenebis(2,5-dimethylphenol), 4,4'-propylidenebis(2,5-dimethylphenol), 4,4'-benzylidenebis(2,5-dimethylphenol), 4,4'-ethylidenebis(2-isopropyl-5-methylphenol),



and combinations of two or more thereof.

41. (Once amended) A process according to ~~any of~~ Claims 34 ~~or~~ 40 35 wherein said aromatic diol has the formula selected from the group consisting of



and combinations of two or more thereof;

each  $R^4$  is independently selected from the group consisting of hydrogen,  $C_1$  to  $C_{12}$  alkyl group,  $C_1$  to  $C_{12}$  cycloalkyl group, acetal, ketal,  $-OR^3$ ,  $-CO_2R^3$ ,  $C_1$  to  $C_{20}$  aryl group,  $-SiR^3$ ,  $-NO_2$ ,  $-SO_3R^3$ ,  $-S(O)R^3$ ,  $-S(O)_2R^3$ ,  $-CHO$ ,  $-C(O)R^3$ ,  $-F$ ,  $-Cl$ ,  $-CN$ ,  $-CF_3$ ,  $-C(O)N(R^3)(R^3)$ ,  $-A^1Z$ , and combinations of two or more thereof;

$Z$  is selected from the group consisting of  $-CO_2R^3$ ,  $-CHO$ ,  $-C(O)R^3$ ,

-C(O)SR<sup>3</sup>, -SR<sup>3</sup>, -C(O)NR<sup>1</sup>R<sup>1</sup>, -OC(O)R<sup>3</sup>, -OC(O)OR<sup>3</sup>, -N=CR<sup>1</sup>R<sup>1</sup>, -C(R<sup>1</sup>)=NR<sup>1</sup>,  
-C(R<sup>1</sup>)=N-O-R<sup>1</sup>, -P(O)(OR<sup>3</sup>)(OR<sup>3</sup>), -S(O)<sub>2</sub>R<sup>3</sup>, -S(O)R<sup>3</sup>, -C(O)OC(O)R<sup>3</sup>,  
-NR<sup>3</sup>CO<sub>2</sub>R<sup>3</sup>, -NR<sup>3</sup>C(O)NR<sup>1</sup>R<sup>1</sup>, F, Cl, -NO<sub>2</sub>, -SO<sub>3</sub>R<sup>3</sup>, -CN, and combinations of two or more thereof;

each R<sup>3</sup> is independently selected from the group consisting of C<sub>1</sub> to C<sub>12</sub> alkyl or cycloalkyl group, C<sub>1</sub> to C<sub>20</sub> aryl group, and combinations of two or more thereof;

each R<sup>5</sup> is independently selected from the group consisting of H, F, Cl, C<sub>1</sub> to C<sub>12</sub> alkyl or cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, -OR<sup>3</sup>, -CO<sub>2</sub>R<sup>3</sup>, -C(O)R<sup>3</sup>, -CHO, -CN, -CF<sub>3</sub>, and combinations of two or more thereof;

each R<sup>6</sup> independently is selected from the group consisting of H, C<sub>1</sub> to C<sub>12</sub> alkyl or cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, and combinations of two or more thereof; and

each R<sup>7</sup> independently is selected from the group consisting of H, C<sub>1</sub> to C<sub>12</sub> alkyl or cycloalkyl, C<sub>6</sub> to C<sub>20</sub> aryl, and combinations of two or more thereof.

45. (Once amended) A process comprising (a) contacting a diolefinic compound, in the presence of a catalyst composition, with a fluid comprising hydrogen cyanide to produce a 2-alkyl-3-monoalkenenitrile; and (b) contacting said 2-alkyl-3-monoalkenenitrile with said catalyst composition wherein said catalyst composition is the composition recited in claims 18-21.

48. (Once amended) A process comprising contacting a 2-alkyl-3-monoalkenenitrile with a catalyst composition wherein said catalyst composition is the composition recited in Claims 18-21.